

QUALITY ASSURANCE PROJECT PLAN
St. John Methyl Bromide Response
Clearance Sampling
St. John, United States Virgin Islands

Prepared for:
United States Environmental Protection Agency/Environmental Response Team
Edison, New Jersey

By:
Lockheed Martin/Scientific, Engineering, Response and Analytical Services
Work Assignment Number: SERAS-270

Based on the Intergovernmental Data Quality Task Force Uniform
Federal Policy for Quality Assurance Project Plans
(Final Version 1.1, June 2006)

April 9, 2015

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QAPP Worksheet #1
Title and Approval Page

Site Name/Project Name: St. John Methyl Bromide Response

Site Location: St. John, United States Virgin Islands (USVI)

Document Title: Quality Assurance Project Plan (QAPP) for the St. John Methyl Bromide Response – Clearance Sampling

Lead Organization: Environmental Protection Agency/Environmental Response Team (EPA/ERT)

Preparer's Name and Organizational Affiliation: Deborah Killeen, Lockheed Martin/Scientific, Engineering, Response and Analytical Services (SERAS)

Preparer's Address, Telephone Number, and E-mail Address: 2890 Woodbridge Avenue, Edison, New Jersey 08837, (732) 321-4245, deborah.a.killeen@lmco.com


Preparation Date (Month/Day/Year): April 9, 2015

Investigative Organization's Project Manager/Date:

 4/15/15
Signature

Printed Name/Organization: Rajeshmal Singhvi/ERT Work Assignment Manager

Investigative Organization's Project QA Officer/Date:

 4/10/15
Signature

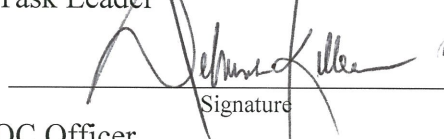
Printed Name/Organization: Stephen Blaze/ERT Quality Coordinator

Lead Organization's Project Manager/Date:

 4/9/15
Signature

Printed Name/Organization: Amy Dubois/SERAS Task Leader

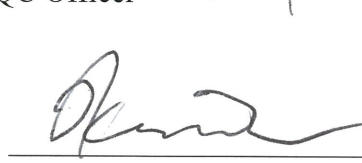
Approval Signatures/Date:

 4/9/15
Signature

Printed Name/Title: Deborah Killeen/SERAS QA/QC Officer

Approval Authority: SERAS

Other Approval Signatures/Date:

 4/9/15
Signature

Printed Name/Title: Kevin Taylor/SERAS Program Manager

Document Numbering System: SERAS-270-DQAPP-040915

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QAPP Worksheet #2 QAPP Identifying Information

Site Name/Project Name: St. John Methyl Bromide Response – Clearance Sampling

Site Location: St. John, USVI

Site Number/Code:

Operable Unit:

Contractor Name: Lockheed Martin

Contractor Number: EP-W-09-031

Contract Title: SERAS

Work Assignment Number: SERAS-270

1. Identify regulatory program: Comprehensive Environmental Response and Compensation Liability Act (CERCLA)

2. Identify approval entity: EPA/ERT

3. The QAPP is (select one): Generic X Project Specific

4. List dates of scoping sessions that were held: NA

5. List dates and titles of QAPP documents written for previous site work, if applicable:

Title	Approval Date
QAPP for St John Methyl Bromide Response, SERAS document #SERAS-001-DQAPP-033015	03/31/15

6. List organizational partners (stakeholders) and connection with lead organization:
EPA/ERT, EPA Region 2, USVI Department of Planning and Natural Resources (DPNR), USVI Department of Health (DOH)

7. List data users:
EPA/ERT, EPA Region 2, USVI DPNR, USVI DOH

8. If any required QAPP elements and required information are not applicable to the project, then circle the omitted QAPP elements and required information on the attached table. Provide an explanation for their exclusions below:

WS #22 – No equipment requiring calibration and/or maintenance was used for this project.
WS #37 – EPA Region 2 will be responsible for assessing the usability of the data.

QAPP Worksheet #2
QAPP Identifying Information
(continued)

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Crosswalk to Related Documents
Project Management and Objectives		
2.1 Title and Approval Page	- Title and Approval Page	1
2.2 Document Format and Table of Contents 2.2.1 Document Control Format 2.2.2 Document Control Numbering System 2.2.3 Table of Contents 2.2.4 QAPP Identifying Information	- Table of Contents - QAPP Identifying Information	2
2.3 Distribution List and Project Personnel Sign-Off Sheet 2.3.1 Distribution List 2.3.2 Project Personnel Sign-Off Sheet	- Distribution List - Project Personnel Sign-Off Sheet	3 4
2.4 Project Organization 2.4.1 Project Organizational Chart 2.4.2 Communication Pathways 2.4.3 Personnel Responsibilities and Qualifications 2.4.4 Special Training Requirements and Certification	- Project Organizational Chart - Communication Pathways - Personnel Responsibilities and Qualifications Table - Special Personnel Training Requirements Table	5 6 7 8
2.5 Project Planning/Problem Definition 2.5.1 Project Planning (Scoping) 2.5.2 Problem Definition, Site History, and Background	- Project Planning Session Documentation (including Data Needs tables) - Project Scoping Session Participants Sheet - Problem Definition, Site History, and Background - Site Maps (historical and present)	9 10
2.6 Project Quality Objectives and Measurement Performance Criteria 2.6.1 Development of Project Quality Objectives Using the Systematic Planning Process 2.6.2 Measurement Performance Criteria	- Site-Specific PQOs - Measurement Performance Criteria Table	11 12

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QAPP Identifying Information
(continued)

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Crosswalk to Related Documents
2.7 Existing Data Evaluation	<ul style="list-style-type: none"> - Sources of Existing Data and Information - Existing Data Criteria and Limitations Table 	13
2.8 Project Overview and Schedule	<ul style="list-style-type: none"> - Summary of Project Tasks 	14
2.8.1 Project Overview	<ul style="list-style-type: none"> - Reference Limits and Evaluation Table 	15
2.8.2 Project Schedule	<ul style="list-style-type: none"> - Project Schedule/Timeline Table 	16
Measurement/Data Acquisition		
3.1 Sampling Tasks	<ul style="list-style-type: none"> - Monitoring Design and Rationale 	17
3.1.1 Sampling Process Design and Rationale	<ul style="list-style-type: none"> - Sample Location Map 	
3.1.2 Sampling Procedures and Requirements	<ul style="list-style-type: none"> - Monitoring Locations and Methods/SOP Requirements Table 	18
3.1.2.1 Sampling Collection Procedures	<ul style="list-style-type: none"> - Analytical Methods/SOP Requirements Table 	19
3.1.2.2 Sample Containers, Volume, and Preservation	<ul style="list-style-type: none"> - Field Quality Control Sample Summary Table 	20
3.1.2.3 Equipment/Sample Containers Cleaning and Decontamination Procedures	<ul style="list-style-type: none"> - Sampling SOPs 	
3.1.2.3 Field Equipment Calibration, Maintenance, Testing, and Inspection Procedures	<ul style="list-style-type: none"> - Project Monitoring SOP References Table 	21
3.1.2.4 Supply Inspection and Acceptance Procedures	<ul style="list-style-type: none"> - Field Equipment Calibration, Maintenance, Testing, and Inspection Table 	NA
3.1.2.6 Field Documentation Procedures		
3.2 Analytical Tasks	<ul style="list-style-type: none"> - Analytical SOPs 	
3.2.1 Analytical SOPs	<ul style="list-style-type: none"> - Analytical SOP References Table 	23
3.2.2 Analytical Instrument Calibration Procedures	<ul style="list-style-type: none"> - Analytical Instrument Calibration Table 	24
3.2.3 Analytical Instrument and Equipment Maintenance, Testing, and Inspection Procedures	<ul style="list-style-type: none"> - Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table 	25
3.2.4 Analytical Supply Inspection and Acceptance Procedures		

QAPP Worksheet #2
QAPP Identifying Information
(continued)

Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Crosswalk to Required Documents
3.3 Sample Collection Documentation, Handling, Tracking, and Custody Procedures 3.3.1 Sample Collection Documentation 3.3.2 Sample Handling and Tracking System 3.3.3 Sample Custody	- Sample Collection Documentation Handling, Tracking, and Custody SOPs - Sample Container Identification - Sample Handling Flow Diagram - Example Chain-of-Custody Form and Seal	26 27
3.4 Quality Control Samples 3.4.1 Sampling Quality Control Samples 3.4.2 Analytical Quality Control Samples	- QC Samples Table - Screening/Confirmatory Analysis Decision Tree	28
3.5 Data Management Tasks 3.5.1 Project Documentation and Records 3.5.2 Data Package Deliverables 3.5.3 Data Reporting Formats 3.5.4 Data Handling and Management 3.5.5 Data Tracking and Control	- Project Documents and Records Table - Analytical Services Table - Data Management SOPs	29 30
Assessment/Oversight		
4.1 Assessments and Response Actions 4.1.1 Planned Assessments 4.1.2 Assessment Findings and Corrective Action Responses	- Assessments and Response Actions - Planned Project Assessments Table - Audit Checklists - Assessment Findings and Corrective Action Responses Table	31 32
4.2 QA Management Reports	- QA Management Reports Table	33
4.3 Final Project Report		

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QAPP Worksheet #2
QAPP Identifying Information
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Required QAPP Element(s) and Corresponding QAPP Section(s)	Required Information	Crosswalk to Related Documents
Data Review		
5.1 Overview		
5.2 Data Review Steps	- Verification (Step I) Process Table	34
5.2.1 Step I: Verification		
5.2.2 Step II: Validation	- Validation (Steps IIa and IIb) Process Table	35
5.2.2.1 Step IIa Validation Activities		
5.2.2.2 Step IIb Validation Activities	- Validation (Steps IIa and IIb) Summary Table	36
5.2.3 Step III: Usability Assessment		
5.2.3.1 Data Limitations and Actions from Usability Assessment	- Usability Assessment	NA
5.2.3.2 Activities		
5.3 Streamlining Data Review		
5.3.1 Data Review Steps To Be Streamlined		
5.3.2 Criteria for Streamlining Data Review		
5.3.3 Amounts and Types of Data Appropriate for Streamlining		

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**QAPP Worksheet #3
Distribution List**

QAPP Recipients	Title	Organization	Telephone Number	Fax Number	E-mail Address	Document Control Number
Raj Singhvi	Work Assignment Manager (WAM)	ERT	(732) 321-6761	(732) 321-6724	Singhvi.raj@epa.gov	SERAS-270-DQAPP-040915
Stephen Blaze	Quality Coordinator	ERT	(732) 906-6921	(732) 321-6724	Blaze.stephen@epa.gov	SERAS-270-DQAPP-040915
Amy Dubois	Environmental Scientist/Task Leader (TL)	SERAS	(732) 494-4007	(732) 494-4021	Amy.e.dubois@lmco.com	SERAS-270-DQAPP-040915
Deborah Killeen	Quality Assurance/Quality Control (QA/QC) Officer	SERAS	(732) 321-4245	(732) 494-4021	Deborah.a.killeen@lmco.com	SERAS-270-DQAPP-040915
Kevin Taylor	Program Manager	SERAS	(732) 321-4202	(732) 494-4021	Kevin.c.taylor@lmco.com	SERAS-270-DQAPP-040915

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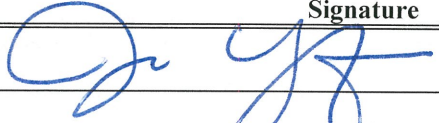
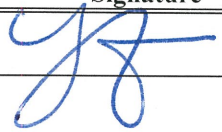
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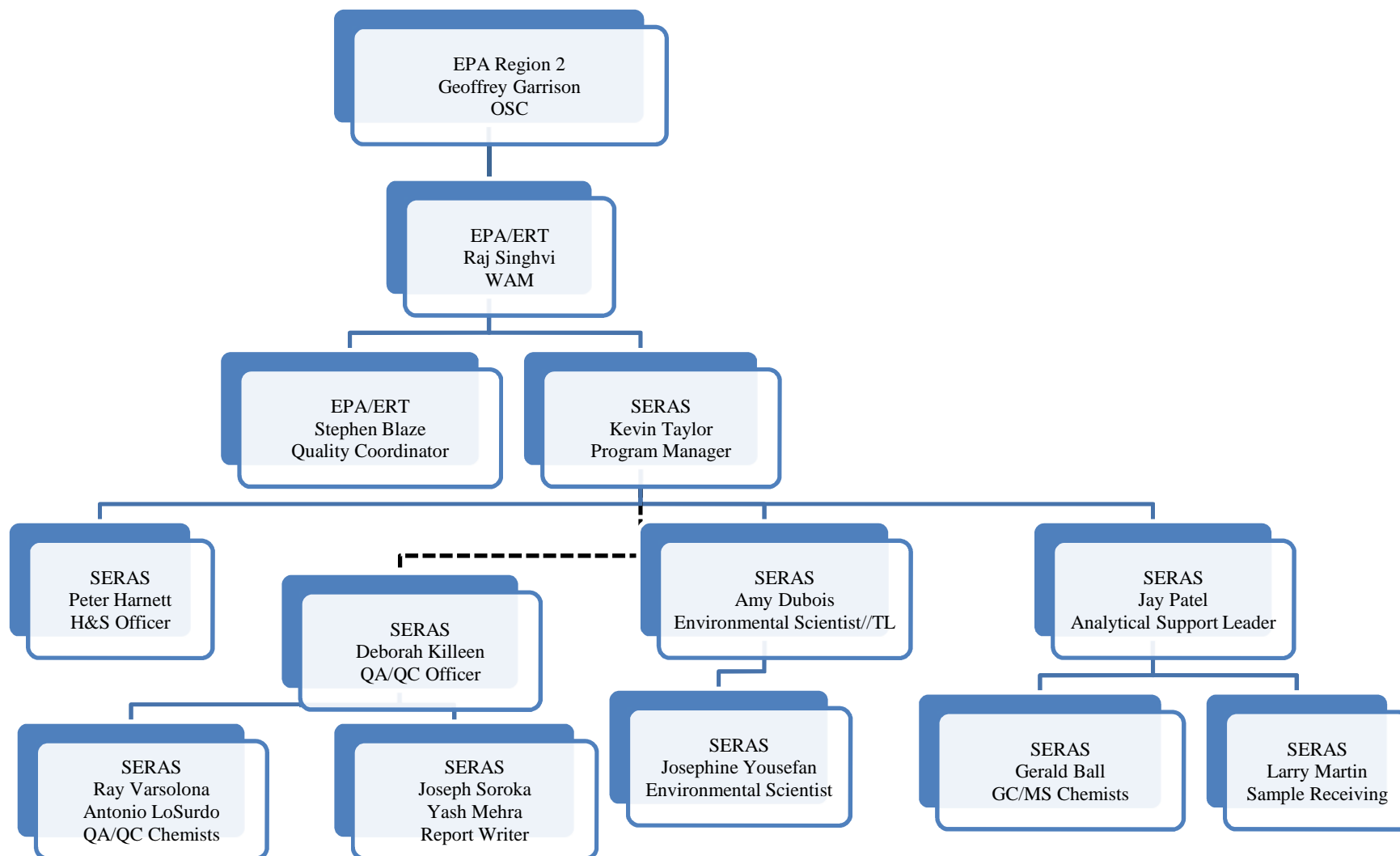
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QAPP Worksheet #4
Project Personnel Sign-Off Sheet

Organization: SERAS/EPA

Project Personnel	Title	Telephone Number	Signature	Date QAPP Read
Josephine Yousefan	SERAS Environmental Scientist/On-Site TL	(732) 321-4284		4/20/15
Geoffrey Garrison	EPA Region 2 On-Scene Coordinator (OSC)	(787) 977-5820		

QAPP Worksheet #5 Project Organizational Chart



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QAPP Worksheet #6
Communication Pathways

<u>Communication Drivers</u>	<u>Responsible Entity</u>	<u>Name</u>	<u>Phone Number</u>	<u>Procedure (Timing, Pathways, etc.)</u>
Approval of initial QAPP and any amendments	ERT WAM ERT Quality Coordinator SERAS Program Manager SERAS QA/QC Officer SERAS TL	Raj Singhvi Stephen Blaze Kevin Taylor Deborah Killeen Amy Dubois	(732) 321-6761 (732) 906-6921 (732) 321-4202 (732) 321-4245 (732) 494-4007	SERAS internal peer review, followed by ERT approval, implementation of changes effective only with approved QAPP or QAPP Change Form.
Nonconformance and Corrective Action	SERAS Environmental Scientist SERAS TL ERT WAM SERAS QA/QC Officer SERAS GC/MS Sr. Chemist	Josephine Yousefan Amy Dubois Raj Singhvi Deborah Killeen Gerald Ball	(732) 321-4284 (732) 494-4007 (732) 321-6761 (732) 321-4245 (732) 321-4286	Use of the Work Assignment Field Change Form for field issues. Use of the laboratory nonconformance memos to document laboratory deviations and/or deficiencies.
Posting of Deliverables to the ERT-Information Management System (IMS) website	SERAS TL SERAS QA/QC Officer SERAS Administrative Support SERAS Air Response Chemist	Amy Dubois Deborah Killeen Eileen Ciambotti Philip Solinski	(732) 494-4007 (732) 321-4245 (732) 321-4255 (732) 321-4283	As per work assignment, posting of deliverables to ERT-IMS website constitutes delivery to the WAM.
Work Assignment	SERAS Program Manager	Kevin C. Taylor	(732) 321-4202	Describes scope of work to SERAS personnel from the ERT WAM.
Health and Safety On-Site Meeting	SERAS Environmental Scientist and/or Site Health and Safety Officer	Josephine Yousefan	(732) 321-4284	Describe potential site hazards, required personal protective equipment, and access to local emergency services.

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QAPP Worksheet #7
Personnel Responsibilities and Qualification Table

Name	Title	Organizational Affiliation	Responsibilities	Education and Experience Qualifications
Philip Solinski	TL/Air Response Chemist	SERAS	Project Oversight	Minimum BS degree plus 14 years related experience/ Lockheed Martin Employee Files
Amy Dubois	SERAS Environmental Scientist/TL	SERAS	Field Operations	Minimum BS degree plus 8 years related experience/ Lockheed Martin Employee Files
Josephine Yousefan	SERAS Environmental Scientist	SERAS	Field Operations	Minimum BS degree plus 3 years related experience/ Lockheed Martin Employee Files
Deborah Killeen	QA/QC Officer	SERAS	QA Oversight	Minimum BS degree plus 14 years related experience/ Lockheed Martin Employee Files
Raj Singhvi	WAM	ERT	Technical Support/Direction	EPA job-related responsibilities/EPA Employee Files
Stephen Blaze	Quality Coordinator	ERT	QA Oversight	EPA job-related responsibilities/EPA Employee Files
Geoffrey Garrison	OSC	EPA	Project Coordination	EPA job-related responsibilities/EPA Employee Files
Gerald Ball	Sr. GC/MS Chemist	SERAS	Volatile Organic Compound (VOC) Analysis (Air)	Minimum BS degree plus 14 years related experience/ Lockheed Martin Employee Files
Ray Varsolona or Tony LoSurdo	QA/QC Chemist	SERAS	Data Validation	Minimum BS degree plus 8 years related experience/ Lockheed Martin Employee Files
Joseph Soroka Yash Mehra	Report Writer	SERAS	Analytical Report & EDD Preparation	Minimum BS degree plus 8 years related experience/ Lockheed Martin Employee Files

EDD – electronic data deliverable

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QAPP Worksheet #8
Special Personnel Training Requirements Table

Project Function	Specialized Training – Title or Description of Course	Training Provider	Training Date	Personnel/Groups Receiving Training	Personnel Titles/ Organizational Affiliation	<u>Location of Training Records/Certificates</u>
Task Leader	Task Leader Training	REAC	2002	Philip Solinski	Air Response Chemist/ SERAS	Quality Files
Task Leader	Task Leader Training	REAC	2002	Amy Dubois	Environmental Scientist/ TL/ SERAS	Quality Files
Site Health & Safety, Field Operations	OSHA 40 hour + 8-hour refresher	SERAS	Mar 2015	Josephine Yousefan	Environmental Scientist/SERAS	Health & Safety Files
QA Oversight	Uniform Federal Policy for Quality Assurance Project Plans	Advanced Systems	Jan 2006	Deborah Killeen	QA/QC Officer/SERAS	Quality Files
QA Oversight	Lead Auditor Training	IT Corp	Sep 1991	Deborah Killeen	QA/QC Officer/SERAS	Quality Files
QA Oversight	Changes to Environmental Laboratory Accreditation	Advanced Systems	May 2009	Deborah Killeen	QA/QC Officer/SERAS Analytical Support Chemist/SERAS	Quality Files
QA Oversight	Data Review & Validation	Laboratory Data Consultants	Jan 2007	Deborah Killeen	QA/QC Officer/SERAS	Quality Files
Data Validation	Data Integrity and Peak Integration Training	SERAS	Jan 2014 [^]	Ray Varsolona Tony LoSurdo	QA/QC Chemist/SERAS	Quality Files
Analytical Report & EDD Preparation	Data Integrity and Peak Integration Training	SERAS	Mar 2015	Joseph Soroka Yash Mehra	Report Writer/SERAS	Quality Files
VOC Analysis	Demonstration of Capability (DOC)	SERAS	Jun 2014	Gerald Ball	Sr. GC/MS Chemist/SERAS	Quality Files
VOC Analysis	Data Integrity and Peak Integration Training	SERAS	Mar 2015	Gerald Ball	Sr. GC/MS Chemist/SERAS	Quality Files

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☒ Worksheet Not Applicable (State Reason)

Since SERAS' role initially was to provide air sampling and analysis support for the initial incident, no scoping meeting was held prior to mobilization.

QAPP Worksheet #9
Project Scoping Session Participants Sheet

Project Name: Projected Date(s) of Sampling: Project Manager:				Site Name: Site Location:	
Date of Session: Scoping Session Purpose:					
Name	Title	Affiliation	Phone Number	E-Mail Address	Project Role

Comments/Decisions:

.

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QAPP Worksheet #10 Problem Definition

<p>The problem to be addressed by the project: On March 20, 2015, paramedics responded to a call that four people staying at the Sirenusa Condominium Resort in Cruz Bay, St. John became very ill. These family members were experiencing seizures and were subsequently hospitalized. It is suspected that the family may have been exposed to the pesticide methyl bromide after it was used to fumigate a room at the complex on Wednesday, March 18, 2015.</p>
<p>ERT was requested by EPA Region 2 during the initial mobilization to provide technical expertise to assess the incident and provide sampling and analysis support. SERAS personnel will remobilize to the Site to provide sampling and analysis support. The data will be used to make decisions on the re-occupancy of the units.</p>
<p>Currently no benchmarks have been derived for the clearance sampling for air and the Regional Screening Levels (RSLs) are being used for guidance. It is assumed that the reporting limits (RLs) may or may not be appropriate for Regional decisions and are based on the laboratory's achievable limits. Once this project transitions from an ER to a follow-up monitoring and/or assessment, benchmarks (project action limits) will need to be derived.</p>
<p>The environmental questions being asked: Is the concentration of methyl bromide present in the units after the decontamination process has been completed less than the Regional RSLs?</p>
<p>Observations from any site reconnaissance reports: Not Applicable.</p>
<p>A synopsis of existing data or information from site reports It is known that the condo below the unit where the family stayed was recently treated for pests by a licensed professional.</p>
<p>The possible classes of contaminants and the affected matrices: Methyl bromide in air</p>
<p>The rationale for inclusion of chemical and nonchemical analyses: Methyl bromide was detected in samples collected during the initial response.</p>
<p>Information concerning various environmental indicators: Not applicable</p>
<p>Project decision conditions ("If..., then..." statements): If the concentrations of methyl bromide in 24-hour time-weighted (TWA) samples collected from the upper and lower units are less than the RSL, then the unit will be cleared for occupancy. Currently no benchmarks have been derived for this project and the Regional Screening Levels (RSLs) are being used for guidance. It is assumed that the reporting limits (RLs) may or may not be appropriate for Regional decisions and are based on the laboratory's achievable limits. Once this project transitions from an ER to a follow-up monitoring and/or assessment, benchmarks (project action limits) will need to be derived.</p>

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QAPP Worksheet #11
Project Quality Objectives /Systematic Planning Process Statements

Who will use the data? EPA Region 2, ERT
What will the data be used for? Data will be used to establish whether methyl bromide concentrations are less than the RSL.
What type of data is needed? (target analytes, analytical groups, field screening, on-site analytical or off-site laboratory techniques, sampling techniques). VOCs including tentatively identified compounds (TICs) in Air – Off-Site Laboratory – SUMMA Canisters
How “good” does the data need to be in order to support the environmental decision? All data will be Definitive and will be validated.
How much data are needed? (number of samples for each analytical group, matrix, and concentration) Up to 9 air samples for VOCs + TICs in SUMMA canisters. Three 24-hour TWA samples will be collected from each unit and 2-3 outdoor ambient air samples..
Where, when, and how should the data be collected/generated? Data will be collected from the locations designated above during the week of April 13, 2015 in accordance with approved sampling procedures..
Who will collect and generate the data? SERAS personnel will collect and analyze samples for VOCs in air.
How will the data be reported? Validated data will be reported in a final analytical report prepared in accordance with SERAS Standard Operating Procedure (SOP) #4020, <i>Analytical Report Preparation</i> . A final Trip Report, prepared in accordance with SERAS SOP #4017, <i>Preparation of Trip Reports</i> , will be the final deliverable to the EPA/ERT WAM. Data will be disseminated to EPA Region 2 by the ERT WAM.
How will the data be archived? Hard copies of all deliverables will be stored in SERAS Central Files and electronic copies will be stored on the SERAS Local Area Network (LAN). Data will be archived by SERAS in accordance with Administrative Procedure (AP) #34, <i>Archiving Electronic Files</i> . All laboratory data will be archived by the SERAS QA/QC Group.

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QAPP Worksheet 12

Measurement Performance Criteria Table

Matrix	Indoor/Ambient Air (SUMMA [®] Canister)				
Analytical Group	VOC + TICs				
Concentration Level	Low Level				
Sampling Procedure¹	Analytical Method/SOP²	Data Quality Indicators (DQIs)	Measurement Performance Criteria	QC Sample and/or Activity Used to Assess Measurement Performance	QC Sample Assesses Error for Sampling (S), Analytical (A) or Both (S&A)
SERAS SOP #1704	SERAS SOP #1814	Precision	Relative Percent Difference (RPD) \pm 25%	Laboratory Duplicates	A
		Accuracy/Bias	\pm 30% Recovery (R) or within control chart limits	Laboratory Control Sample (LCS)	A
		Accuracy/Bias	\pm 40% of mean area response	Internal Standards	A
		Accuracy/Bias Contamination	No target compound \geq Reporting Limit (RL)	Method Blank Trip Blank	A S & A
		Sensitivity/Accuracy	LOD - Standard deviation of 7 replicates x Student's t-factor < RL LOQ \pm 30% or within control chart limits	Limit of Detection/Limit of Quantitation (LOD/LOQ)	A
		Completeness	> 90% SUMMA [®] sampling, > 90% laboratory analysis	Data Completeness Check	S & A

¹Reference number from QAPP Worksheet #21 (see Section 3.1.2)

²Reference number from QAPP Worksheet #23 (see Section 3.2)

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QAPP Worksheet #13
Existing Data Criteria and Limitations Table

<u>Existing Data</u>	Data Source (Originating Organization, Report Title, and Date)	Data Generator(s) (Originating Org., Data Types, Data Generation/ Collection Dates)	How Data Will Be Used	Limitations on Data Use
Laboratory Validated Data	Lockheed Martin (LM)/SERAS, Preliminary Data dated 03/17/15 and 04/03/15	LM/SERAS, sampling dates 03/24/15, 03/27/15 & 03/28/15	Data were generated after the incident occurred. Data obtained after decontamination of the units may be compared to assess effectiveness.	Historical Data

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QAPP Worksheet #14 **Summary of Project Tasks**

Sampling Tasks: VOCs in Air (SUMMA Canister) –Samples of indoor air will be collected using a flow controller attached to each canister that will be fitted with a restrictive orifice set at ~3.4 milliliter/minute (mL/min) to collect between 4 to 5-L of sample. Samples of outside ambient air will also be collected.
Analysis Tasks: VOCs in Air – SERAS SOP #1814
Quality Control Tasks: Field QC samples are described in Worksheet #20. Analytical QC samples are described in Worksheets #12 and 28. A trip blank will be submitted with each shipment of VOC air samples.
Existing Data: Previously collected data collected after the initial response.
Data Management Tasks: All sampling locations will be identified by a field assigned number. Field sampling data will be recorded on field sampling worksheets. All samples will be delivered under chain of custody (COC) to the respective laboratories listed on Worksheet #14. Scribe will be used for data management activities. All deliverables will be generated in accordance to the appropriate SERAS SOP and posted to the ERT/IMS website upon completion. Posting to the ERT-IMS site will be considered as completion of the deliverable.
Documentation and Records: All documentation will be recorded in accordance with SERAS SOP #4001, <i>Logbook Documentation</i> and SOP #2002, <i>Sample Documentation</i> . Documents and records that may be generated during this project include: WP, QAPP, HASP, Laboratory Logbooks, Site Map, Sample Labels, COC Records, Custody Seals, Air Sampling Work Sheets, Data Review Records, Data Reduction Records, Data Assessment Forms, Data Validation Records, Instrument Printouts, Laboratory Analytical Reports, Scribe Database, Final Trip Report, Final Analytical Report, Field Change Form (if required)
Assessment/Audit Tasks: No performance audits of field operations are anticipated for this project. The tasks associated with this QAPP are assessed using peer reviews and management system reviews. Peer review enables the field chemist to identify and correct reporting errors before reports are submitted. Management system reviews establish compliance with prevailing management structure, policies and procedures, and ensures that the required data are obtained.
Data Review Tasks: Analytical data will be validated in accordance with the methods listed on Worksheet #36. All project deliverables will receive an internal peer review prior to release, per guidelines established in the SERAS AP #22, <i>Peer Review of SERAS Deliverables</i> .

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QAPP Worksheet #15-1 Reference Limits and Evaluation Table

Matrix: Indoor/Ambient Air

Analytical Group: VOC + TICs

Concentration Level: Low

Analyte	CAS Number	Project Action Limit ¹ (µg/m ³ / ppbv)	Project Quantitation Limit (ppbv)	SERAS SOP #1814 Analytical Method		SERAS Achievable Laboratory Limits	
				MDLs (ppbv)	Method QLs (ppbv)	MDLs ² (ppbv)	QLs (ppbv)
Propylene	115-07-1	3100/1800	0.0200	NS	0.0200	0.00475	0.0200
Dichlorodifluoromethane	75-71-8	100/20.2	0.0200	NS	0.0200	0.00163	0.0200
Chloromethane	74-87-3	94/45.5	0.0200	NS	0.0200	0.00260	0.0200
1,2-Dichlorotetrafluoroethane	76-14-2	NS	0.0200	NS	0.0200	0.00103	0.0200
Vinyl chloride	75-01-4	0.17/0.067	0.0200	NS	0.0200	0.00295	0.0200
1,3-Butadiene	106-99-0	0.094/0.042	0.0200	NS	0.0200	0.01192	0.0200
Bromomethane	74-83-9	5.2/1.34	0.0200	NS	0.0200	0.00279	0.0200
Chloroethane	75-00-3	10000/3790	0.0200	NS	0.0200	0.00311	0.0200
Acetone	67-64-1	32000/13500	0.200	NS	0.200	0.0230	0.200
Trichlorofluoromethane	75-69-4	730/130	0.0200	NS	0.0200	0.00111	0.0200
Isopropyl Alcohol	67-63-0	210/85.5	0.200	NS	0.200	0.00509	0.200
1,1-Dichloroethene	75-35-4	210/53	0.0200	NS	0.0200	0.00182	0.0200
Methylene chloride	75-09-2	100/28.8	0.0200	NS	0.0200	0.00207	0.0200
1,1,2-Trichlorotrifluoromethane	76-13-1	31000/4045	0.0200	NS	0.0200	0.00385	0.0200
trans-1,2-Dichloroethene	156-60-5	NS	0.0200	NS	0.0200	0.00242	0.0200
1,1-Dichloroethane	75-34-3	1.8/0.45	0.0200	NS	0.0200	0.00219	0.0200
Methyl tert-butyl ether	1634-04-4	11/3.1	0.0200	NS	0.0200	0.00186	0.0200
Vinyl Acetate	108-05-4	210/59.6	0.0200	NS	0.0200	0.00374	0.0200
2-Butanone	78-93-3	5200/1760	0.200	NS	0.200	0.00350	0.200
cis-1,2-Dichloroethene	156-59-2	NS	0.0200	NS	0.0200	0.00349	0.0200
Ethyl Acetate	141-78-6	73/20.26	0.0200	NS	0.0200	0.00654	0.0200
Hexane	110-54-3	730/207	0.0200	NS	0.0200	0.00252	0.0200
Chloroform	67-66-3	0.12/0.025	0.0200	NS	0.0200	0.00275	0.0200

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QAPP Worksheet #15-1
Reference Limits and Evaluation Table

Matrix: Indoor/Ambient Air

Analytical Group: VOC + TICs

Concentration Level: Low

Analyte	CAS Number	Project Action Limit ¹ (µg/m ³ / ppbv)	Project Quantitation Limit (ppbv)	SERAS SOP #1814 Analytical Method		SERAS Achievable Laboratory Limits	
				MDLs (ppbv)	Method QLs (ppbv)	MDLs ² (ppbv)	QLs (ppbv)
Tetrahydrofuran	109-99-9	2100/712	0.0200	NS	0.0200	0.00226	0.0200
1,2-Dichloroethane	107-06-2	0.11/0.027	0.0200	NS	0.0200	0.00150	0.0200
1,1,1-Trichloroethane	71-55-6	5200/953	0.0200	NS	0.0200	0.00184	0.0200
Benzene	71-43-2	0.36/0.113	0.0200	NS	0.0200	0.00219	0.0200
Carbon Tetrachloride	56-23-5	0.47/0.075	0.0200	NS	0.0200	0.00225	0.0200
Cyclohexane	110-82-7	6300/1830	0.0200	NS	0.0200	0.00508	0.0200
1,2-Dichloropropane	78-87-5	0.28/0.061	0.0200	NS	0.0200	0.00329	0.0200
1,4-Dioxane	123-91-1	0.56/0.155	0.0200	NS	0.0200	0.00135	0.0200
Trichloroethene	79-01-6	0.48/0.089	0.0200	NS	0.0200	0.00398	0.0200
Heptane	142-82-5	NS	0.0200	NS	0.0200	0.00403	0.0200
cis-1,3-Dichloropropene	10061-01-5	0.71 ^(a) /0.156 ^(a)	0.0200	NS	0.0200	0.00227	0.0200
Methyl Isobutyl Ketone	108-10-1	3100/757	0.0200	NS	0.0200	0.00275	0.0200
trans-1,3-Dichloro-propene	10061-02-6	0.71 ^(a) /0.156 ^(a)	0.0200	NS	0.0200	0.00202	0.0200
1,1,2-Trichloroethane	79-00-5	0.18/0.033	0.0200	NS	0.0200	0.00202	0.0200
Toluene	108-88-3	5200/1380	0.0200	NS	0.0200	0.00265	0.0200
2-Hexanone	591-78-6	31/7.6	0.0200	NS	0.0200	0.00287	0.0200
Dibromochloromethane	124-48-1	0.10/0.012	0.0200	NS	0.0200	0.00120	0.0200
1,2-Dibromoethane	106-93-4	0.0047/0.00061	0.0200	NS	0.0200	0.00167	0.0200
Tetrachloroethene	127-18-4	11/1.62	0.0200	NS	0.0200	0.00125	0.0200
Chlorobenzene	108-90-7	52/11.3	0.0200	NS	0.0200	0.00143	0.0200
Ethylbenzene	100-41-4	1.1/0.253	0.0200	NS	0.0200	0.00117	0.0200
m,p-Xylene	108-38-3/ 106-42-3	200/46.1	0.0200	NS	0.0200	0.00230	0.0200

QAPP Worksheet #15-1

Reference Limits and Evaluation Table

Matrix: Indoor/Ambient Air

Analytical Group: VOC + TICs

Concentration Level: Low

Analyte	CAS Number	Project Action Limit ¹ (µg/m ³ / ppbv)	Project Quantitation Limit (ppbv)	SERAS SOP #1814 Analytical Method		SERAS Achievable Laboratory Limits	
				MDLs (ppbv)	Method QLs (ppbv)	MDLs ² (ppbv)	QLs (ppbv)
Bromoform	75-25-2	2.6/0.252	0.0200	NS	0.0200	0.00109	0.0200
Styrene	100-42-5	1000/235	0.0200	NS	0.0200	0.00233	0.0200
1,1,2,2-Tetrachloroethane	79-34-5	0.048/0.0070	0.0200	NS	0.0200	0.00248	0.0200
o-Xylene	95-47-6	100/23	0.0200	NS	0.0200	0.00113	0.0200
Ethyltoluene	622-96-8	NS	0.0200	NS	0.0200	0.000910	0.0200
1,3,5-Trimethylbenzene	108-67-8	NS	0.0200	NS	0.0200	0.00128	0.0200
1,2,4-Trimethylbenzene	95-63-6	7.3/1.49	0.0200	NS	0.0200	0.000728	0.0200
1,3-Dichlorobenzene	541-73-1	NS	0.0200	NS	0.0200	0.00195	0.0200
1,4-Dichlorobenzene	106-46-7	0.26/0.043	0.0200	NS	0.0200	0.00164	0.0200
1,2-Dichlorobenzene	95-50-1	210/34.9	0.0200	NS	0.0200	0.00162	0.0200
Naphthalene	91-20-3	0.083/0.016	0.0200	NS	0.0200	0.00173	0.0200

NS = Not Specified

¹ Regional Screening Level (RSL) Resident Air Supporting Table, November 2014 – lower of the carcinogenic target risk and the noncancer hazard index; Updated Jan 2015; http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/docs/master_sl_table_run_NOV2014.pdf

(a) Total cis/trans-1,3-dichloropropene

²Based on LOD/LOQ study dated 06/17/14 for instrument Air1

Bold indicates potential contaminant of concern

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QAPP Worksheet #16
Project Schedule Timeline Table

Activities	Organization	Dates (MM/DD/YY)		Deliverable	Deliverable Due Date
		Anticipated Date(s) of Initiation	Anticipated Date of Completion		
Field Activities	SERAS	April 13, 2015	April 15, 2015	Trip Report	2 weeks after receipt of analytical data
Laboratory Prelims	ERT/SERAS	April 17, 2015	April 20, 2015	Data Package	Within 48-72 hours
Validation & Report Preparation	SERAS	April 20, 2015	April 24, 2015	Analytical Report	Within 5 business days after receipt of data

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☐ Worksheet Not Applicable (State Reason)

QAPP Worksheet #17
Sampling Design and Rationale

Describe and provide a rationale for choosing the sampling approach (e.g., grid system, biased statistical approach): Selection of sample locations will be based on previous sampling conducted during the initial response.
Describe the sampling design and rationale in terms of what matrices will be sampled, what analytical groups will be analyzed and at what concentration levels, the sampling locations (including QC, critical, and background samples): Indoor air samples will be collected from the lower unit that had been fumigated and the upper unit where the family resided. Outdoor ambient air samples will also be collected to determine if there is an impact to the indoor air. Indoor and ambient air samples will be analyzed for VOCs + TICs.

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QAPP Worksheet #18
Monitoring Locations and Methods/SOP Requirements Table

Sampling Location/ID Number	Matrix	Depth	Analytical Group	Concentration Level	Number of Samples (identify field duplicates)	Sampling SOP Reference	Rationale for Sampling Location
TBD/Upper Unit	Air	NA	VOC + TICs	Low	1	SERAS SOP #1704	Judgmental
TBD/Upper Unit	Air	NA	VOC + TICs	Low	1	SERAS SOP #1704	Judgmental
TBD/Upper Unit	Air	NA	VOC + TICs	Low	1	SERAS SOP #1704	Judgmental
TBD/Lower Unit	Air	NA	VOC + TICs	Low	1	SERAS SOP #1704	Judgmental
TBD/Lower Unit	Air	NA	VOC + TICs	Low	1	SERAS SOP #1704	Judgmental
TBD/Lower Unit	Air	NA	VOCs + TICs	Low	1	SERAS SOP #1704	Judgmental
TBD/ Ambient Air	Air	NA	VOCs + TICs	Low	3	SERAS SOP #1704	Judgmental

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QAPP Worksheet #19
Analytical SOP Requirements Table

Matrix	Analytical Group	Concentration Level	Analytical and Preparation Method/SOP Reference ¹	Sample Volume	Containers (number, size, and type)	Preservation Requirements (chemical, temperature, light protected)	Maximum Holding Time (preparation/analysis)
Air	VOC + TICs	Low	SERAS SOP #1814	4 to 5-L	6-L SUMMA [®] Canister	None	30 days

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QAPP Worksheet #20
Field Quality Control Sample Summary Table

Matrix	Analytical Group	Concentration Level	Analytical and Preparation SOP Reference ¹	No. of Sampling Locations	No. of Field Duplicate Pairs	No. of BS/MS	No. of Trip Blanks	No. of Field Blanks	No. of PT Samples	Total No. of Samples to Lab
Air	VOC + TICs	Low	SERAS SOP #1814	9	NA	NA	1	NA	NA	10

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QAPP Worksheet #21
Project Monitoring SOP References Table

Reference Number	Title, Revision Date and/or Number	Originating Organization	Equipment Type	Modified for Project Work? (Check if yes)	Comments
1704	<i>SUMMA Canister Sampling</i>	SERAS	Canister Sampling	<input type="checkbox"/>	
2001	<i>General Field Sampling Guidelines</i>	SERAS	General Sampling	<input type="checkbox"/>	
2002	<i>Sample Documentation</i>	SERAS	NA	<input type="checkbox"/>	
2003	<i>Sample Storage, Preservation and Handling</i>	SERAS	Sample Handling	<input type="checkbox"/>	
2004	<i>Sample Packaging and Shipment</i>	SERAS	NA	<input type="checkbox"/>	
2005	<i>Quality Assurance/Quality Control Samples</i>	SERAS	NA	<input type="checkbox"/>	
2008	<i>General Air Sampling Guidelines</i>	SERAS	NA	<input type="checkbox"/>	
4001	<i>Logbook Documentation</i>	SERAS	Site Activities	<input type="checkbox"/>	
4005	<i>Chain of Custody Procedures</i>	SERAS	NA	<input type="checkbox"/>	

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☒ Worksheet Not Applicable (State Reason) Only sampling and analysis will be conducted for this project.

QAPP Worksheet #22
Field Equipment Calibration, Maintenance, Testing, and Inspection Table

Field Equipment/ Instrument	Calibration Activity	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference ¹

¹Specify the appropriate reference letter or number from the Project Sampling SOP References table ([Worksheet #21](#))

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QAPP Worksheet #23
Analytical SOP References Table

Reference Number	Title, Revision Date, and/or Number	Definitive or Screening Data	Analytical Group	Instrument	Organization Performing Analysis	Modified for Project Work?
SERAS SOP #1814	Analysis of Volatile Organic Compounds (VOCs) in SUMMA Canister Air Samples by Gas Chromatography/Mass Spectrometry (GC/MS)	Definitive	VOC + TICs	GC/MS	ERT/SERAS Laboratory	No

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QAPP Worksheet #24
Analytical Instrument Calibration Table

Instrument	Calibration Procedure	Frequency of Calibration	Acceptance Criteria	Corrective Action (CA)	Person Responsible for CA	SOP Reference¹
GC/MS	BFB Tune	Every 24 hours before any standards, blanks or samples are analyzed	Within the tune performance criteria	Retune if ion abundances are outside criteria	Analyst	SERAS SOP #1814
GC/MS	Initial calibration (IC), minimum 5-points for all analytes	Initially prior to sample analysis. After changes to instrument and when instrument does not meet method criteria.	Relative standard deviation (RSD) = $\leq 30\%$, two compounds may exceed up to 40% RSD	Inspect system for problems; perform maintenance (i.e. ion source cleaning, column replacement, etc.), check calibration standards. Rerun IC, reanalyze affected samples	Analyst	SERAS SOP #1814
GC/MS	Initial Calibration Verification (ICV)	Immediately following an initial calibration	Percent recovery (%R) = $\pm 30\%$	Rerun ICV. If needed, inspect system for problems, perform maintenance (i.e. ion source cleaning, column replacement, etc.), rerun IC	Analyst	SERAS SOP #1814
GC/MS	Daily Continuing Calibration Check (CCC)	Every 24 hours	Percent difference (%D) = $\pm 30\%$	Rerun CCC. If needed, inspect system for problems, perform maintenance (i.e. ion source cleaning, column replacement, etc.), rerun IC	Analyst	SERAS SOP #1814

¹Specify the appropriate reference letter or number from the Analytical SOP References table (Worksheet #23).

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QAPP Worksheet #25
Analytical Instrument and Equipment Maintenance, Testing, and Inspection Table

Instrument/ Equipment	Maintenance Activity	Testing Activity	Inspection Activity	Frequency	Acceptance Criteria	Corrective Action	Responsible Person	SOP Reference¹
GC/MS	Check gas supply daily, bake or change trap as needed, manual tune if 4-Bromofluorobenzene (BFB) not within criteria, cut or change column, change septum as needed.	Analysis	Check ion source, gas supply, septum seal, vacuum, trap	Prior to sample analysis or when instrument does not meet criteria	BFB criteria achieved, Relative standard deviation (RSD) = $\leq 30\%$, two compounds may exceed up to 40% RSD in the IC	Recalibrate and/or perform necessary instrument maintenance, check calibration standards, re-analyze affected samples.	Analyst	SERAS SOP #1814

¹Specify the appropriate reference letter or number from Analytical SOP References table (Worksheet #23).

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QAPP Worksheet #26
Sample Handling System

SAMPLE COLLECTION, PACKAGING, AND SHIPMENT
Sample Collection (Personnel/Organization): Josephine Yousefan/SERAS
Sample Packaging (Personnel/Organization): Josephine Yousefan/SERAS
Coordination of Shipment (Personnel/Organization): Josephine Yousefan/SERAS
Type of Shipment/Carrier: Overnight carrier to appropriate laboratory.
SAMPLE RECEIPT AND ANALYSIS
Sample Receipt (Personnel/Organization): Larry Martin, Sample Receiving Technician, ERT/SERAS Laboratory, Edison, NJ
Sample Custody and Storage (Personnel/Organization): Larry Martin, Sample Receiving Technician , Gerald Ball, Sr. GC/MS Chemist, ERT/SERAS Laboratory, Edison, NJ
Sample Preparation (Personnel/Organization): Gerald Ball, Sr. GC/MS Chemist, ERT/SERAS Laboratory, Edison, NJ
Sample Determinative Analysis (Personnel/Organization): Gerald Ball, Sr. GC/MS Chemist, ERT/SERAS Laboratory, Edison, NJ
SAMPLE ARCHIVING
Field Sample Storage (No. of days from sample collection): Samples will be shipped within 24-48 hours pf collection from the St Thomas Fedex facility to SERAS.
Sample Extract/ Digestate Storage (No. of days from extraction/digestion): In accordance with the method's requirements
Biological Sample Storage (No. of days from sample collection): Not applicable
SAMPLE DISPOSAL
Personnel/Organization: Not applicable
Number of Days from Analysis: Not applicable

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QAPP Worksheet #27

Sample Custody Requirements

<p>Field Sample Custody Procedures (sample collection, packaging, shipment, and delivery to laboratory): Each sample will be affixed with a label identifying the sample number, sample location, collection date, collection time, matrix, and requested analysis. The samples will be stored and mobilized in shipping containers.</p>
<p>Scribe will be used for sample management, as well as generation of sample documentation, such as labels and COC Records, if feasible in the field; otherwise, hard copies of labels and COC records will be used. All COC records will receive a peer review prior to relinquishment in accordance with SERAS SOP # 4005, <i>Chain of Custody Procedures</i>. The samples collected by SERAS personnel will be mobilized to Edison, NJ and relinquished under the COC to the respective laboratories for analysis in accordance with SERAS SOP #2004, <i>Sample Packaging and Shipment</i>.</p>
<p>Laboratory Sample Custody Procedures (receipt of samples, archiving, and disposal): Samples delivered to the laboratories will be accepted by sample receiving personnel. Samples will be checked for discrepancies, integrity, etc. If noted, issues will be forwarded to the appropriate manager for corrective action. The sample custodian will relinquish custody to the appropriate department for analysis. At this time, no samples will be archived at the laboratory. Disposal of the samples will occur only after analyses and QA/QC checks are completed.</p>
<p>Sample Identification Procedures: Samples will be identified with unique location identifier based on location. Procedures outlined in SERAS SOP #2002, <i>Sample Documentation</i> will be applied (refer to Worksheet #21).</p>
<p>Chain-of-custody Procedures: Chain-of-custody records will be generated for all samples submitted for analysis using Scribe database software. Procedures outlined in SERAS SOP #4005, <i>Chain of Custody Procedures</i> will be applied.</p>

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QAPP Worksheet #28
QC Samples Table

Matrix	Indoor/Ambient Air (SUMMA [®] Canister)					
Analytical Group	VOC					
Concentration Level	Low Level Scan					
Sampling SOP	SERAS SOP#1704					
Analytical Method/ SOP Reference	SERAS SOP #1814					
Sampler's Name	Josephine Yousefan					
Field Sampling Organization	SERAS					
Analytical Organization	ERT/SERAS Laboratory					
No. of Sample Locations	~ 6					
QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
Internal Standard	Each sample	±40% of daily calibration IS response	Re-analyze sample	Analyst	Accuracy/Bias	±40% of daily calibration IS response
LCS	5% of samples	%R – 70 – 130% or within control chart limits	Clean, repair, re-analyze	Analyst	Accuracy/Bias	%R – 70 – 130% or within control chart limits
Method Blank	1/24-hour clock	<RL	Clean, repair, re-analyze	Analyst	Accuracy/Bias	<RL
Trip Blank	1/shipment	NS	Qualify Data	QA/QC Chemist	Accuracy/Bias/ Contamination	<RL
Lab Duplicates	1/10 samples	RPD ±25%	Reanalyze, document in case narrative	Analyst	Precision	RPD ±25%

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QAPP Worksheet #28
QC Samples Table

Matrix	Indoor/Ambient Air (SUMMA [®] Canister)					
Analytical Group	VOC					
Concentration Level	Low Level Scan					
Sampling SOP	SERAS SOP#1704					
Analytical Method/ SOP Reference	SERAS SOP #1814					
Sampler's Name	Josephine Yousefan					
Field Sampling Organization	SERAS					
Analytical Organization	ERT/SERAS Laboratory					
No. of Sample Locations	~ 6					
QC Sample:	Frequency/Number	Method/SOP QC Acceptance Limits	Corrective Action	Person(s) Responsible for Corrective Action	Data Quality Indicator (DQI)	Measurement Performance Criteria
LOD/LOQ Study	Annual	LOD – Standard deviation of 7 replicates multiplied by the students T-factor <RL LOQ - %R ±30% or within control chart limits	Clean, repair, re-analyze.	Analyst	Sensitivity/Accuracy	LOD – Standard deviation of 7 replicates multiplied by the students T-factor <RL LOQ - %R ±30% or within control chart limits

NS = Not specified

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QAPP Worksheet #29
Project Documents and Records Table

Sample Collection Documents and Records	Monitoring Data Documents and Records	Off-site Analysis Documents and Records	Data Assessment Documents and Records	Other
Chain of custody records Sample Labels Custody Seals SUMMA [®] Sampling Worksheets Field Change Form (if necessary)		Sample Receipt Logs Internal and External COC forms Equipment Calibration Logs Sample Analysis Worksheets/Run Logs Laboratory Final Data Package Corrective Action Documents	Data Assessment Forms Data Validation Check Records UFP-QAPP Checklist	Scribe Database Analytical Report Trip Report

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QAPP Worksheet #30
Analytical Services Table

Matrix	Analytical Group	Concentration Level	Sample Location/ID Numbers	Analytical SOP	Data Package Turnaround Time	Laboratory/Organization (Name and Address, Contact Person and Telephone Number)	Backup Laboratory/Organization (Name and Address, Contact Person and Telephone Number)
Indoor/ Ambient Air (SUMMA® Canister)	VOC + TICs	Low Level Scan	See Worksheet #18	SERAS SOP #1814	Preliminary Data – 24-48 hours Data validation and Analytical Report in 5 business days from receipt of data package	ERT/SERAS Laboratory Lockheed Martin – SERAS 2890 Woodbridge Ave Edison, NJ 08837 732-321-4200 Jay Patel, Analytical Support Leader Gerald Ball Sr. GC/MS Chemist	NA

NA = Not applicable

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QAPP Worksheet #31
Planned Project Assessments Table

Assessment Type	Frequency	Internal or External	Organization Performing Assessment	Person(s) Responsible for Performing Assessment (Title and Organizational Affiliation)	Person(s) Responsible for Responding to Assessment Findings (Title and Organizational Affiliation)	Person(s) Responsible for Identifying and Implementing Corrective Actions (CA) (Title and Organizational Affiliation)	Person(s) Responsible for Monitoring Effectiveness of CA (Title and Organizational Affiliation)
Laboratory Accreditation Audit	Every 2 years	External	NELAC Accreditation Agency	NJDEP	Deborah Killeen, QA/QC Officer – SERAS	Jay Patel, Analytical Support Leader/SERAS	NJDEP
Internal Laboratory Audit	Annual	Internal	SERAS	Deborah Killeen, QA/QC Officer - SERAS	Jay Patel, Analytical Support Leader/SERAS	Jay Patel, Analytical Support Leader/SERAS	Deborah Killeen, QA/QC Officer - SERAS
Performance Evaluation Samples	Annual (Air)	External	NELAP PT Provider	NELAP PT Provider	Deborah Killeen, QA/QC Officer - SERAS	Jay Patel, Analytical Support Leader/SERAS	NJDEP

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QAPP Worksheet #32
Assessment Findings and Corrective Action Responses

Assessment Type	Nature of Deficiencies Documentation	Individual(s) Notified of Findings (Name, Title, Organization)	Timeframe of Notification	Nature of Corrective Action Response Documentation	Individual(s) Receiving Corrective Action Response (Name, Title, Org.)	Timeframe for Response
Field Observations/ Deviations from Work Plan	Logbook	Josephine Yousefan/Environmental Scientist/SERAS	Immediately	Field Change Form	Josephine Yousefan/Environmenta l Scientist/SERAS	Within 24 hours of change
Peer Review	In the deliverable	Amy Dubois TL/SERAS	Prior to deliverable due date	Comments directly in the deliverable	Amy Dubois/TL SERAS	Prior to deliverable due date
Internal Lab Performance Audit	Audit report	Jay Patel, Analytical Support Leader/SERAS	Within 45 days	Corrective Action Plan	Deborah Killeen, QA/QC Officer, SERAS	Within 45 days
External Lab Performance Audit	Audit Report	Deborah Killeen, SERAS QA/QC Officer	Within 30 days	Corrective Action Plan	NJDEP	Within 30 days

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QAPP Worksheet #33
QA Management Reports Table

Type of Report	Frequency (daily, weekly monthly, quarterly, annually, etc.)	Projected Delivery Date(s)	Person(s) Responsible for Report Preparation (Title and Organizational Affiliation)	Report Recipient(s) (Title and Organizational Affiliation)
Technical Report	Monthly	20 th of the month following performance period	Amy Dubois TL/SERAS	ERT Project Officer and WAM
QA Report	Quarterly	February, May, August, and November	QA/QC Officer/SERAS	ERT Project Officer and Quality Coordinator

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QAPP Worksheet #34
Verification (Step I) Process Table

Verification Input	Description	Internal/ External	Responsible for Verification (Name, Organization)
Chain of Custody Record	Reviewed by Field Sampling Personnel in field and QA/QC Group prior to final analytical report preparation	Internal	SERAS
Laboratory Data Package	Reviewed for measurement performance criteria	Internal/	SERAS Analytical Support Leader SERAS QA/QC Chemist
Analytical Report	Reviewed for accuracy	Internal	Peer Review Team
Trip Report	Reviewed for accuracy	Internal	Peer Review Team
Completeness Check	Review of Planning Documents, Analytical Data package, Sampling Documents and External Reports, as applicable, using the UFP-QAPP Checklist	Internal	SERAS TL SERAS QA/QC Chemist

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QAPP Worksheet #35
Validation (Steps IIa and IIb) Process Table

Step IIa/IIb	Validation Input	Description	Responsible for Validation (Name, Organization)
IIa	SOPs	Ensure that the sampling methods/procedures outlined in the QAPP were followed and any deviations noted	SERAS TL, WAM
IIa	COC Records	Examine COC records and match with requested analyses.	SERAS TL
IIa	Lab Data Package	Examine packages against COC records (holding times, sample handling, methods, sample identifications, qualifiers).	SERAS Sr. GC/MS Chemist
IIb	Lab Data Package	Qualify data based on QC deficiencies (precision/accuracy, %RSD, %D, etc.)	SERAS QA/QC Chemist SERAS QA/QC Officer

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QAPP Worksheet #36
Validation (Steps IIa and IIb) Summary Table

Step IIa/IIb	Matrix	Analytical Group	Concentration Level	Validation Criteria	Data Validator (title and organizational affiliation)
IIb	Indoor/Ambient Air (SUMMA [®] Canister)	VOC	Low Level Scan	Draft SOP #1021, <i>Data Validation Procedures for Routine Volatile Organic Analysis in Air by TO-15</i>	SERAS QA/QC Chemist

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EPA Region 2 will be responsible for assessing the usability of the data.

QAPP Worksheet #37
Usability Assessment

Summarize the usability assessment process and all procedures, including interim steps and any statistics, equations, and computer algorithms that will be used:
Describe the evaluative procedures used to assess overall measurement error associated with the project:
Identify the personnel responsible for performing the usability assessment: Region 2
Describe the documentation that will be generated during usability assessment and how usability assessment results will be presented so that they identify trends, relationships (correlations), and anomalies: